

**ABSTRACT**

A method for repairing defects in a metallic substrate comprising the steps of placing a consumable filler slug in contact with the substrate in the vicinity of the defect; bringing a first electrode and a second electrode in contact with the consumable slug and applying a pressure to the consumable slug; and transmitting electrical current between the electrodes for a period, thereby resistively heating the consumable slug and the metallic substrate resulting in coalescence in a substantially liquid pool that fills the defect. The pool is then cooled to solidification under the pressure of the electrodes. The electrodes are then removed from contact with the consumable slug and excess material may be removed. The consumable slug may be formed as a single unit or multiple sections, and may incorporate sacrificial retainers to add additional defect filling material, retain the pool, and seal the pool from atmosphere.